IN THE CLAIMS

1. (Currently Amended) A Taylor reactor for conducting material conversions, comprising:

a) an annular reactor volume defined by an external reactor wall, a concentrically or eccentrically disposed rotor that extends the length of the reactor, a reactor floor, and a reactor lid,

b) at least one means for metered addition of reactants into the annular reactor volume, and

c) a means for the discharge of product from the annular reactor volume,

wherein

d) during a conversion within the annular reactor volume there is a change in a viscosity v of a reaction medium, ~~and~~

e) one or more of the reactor wall and the rotor are geometrically designed such that the conditions for Taylor vortex flow are met over essentially the entire reactor length of the annular reactor volume, and

f) the reactor is not mounted horizontally, and the discharge means is mounted higher that the metered addition means so that a flow through the reactor is counter to gravity.

2. (Previously Presented) The Taylor reactor of claim 1, wherein the external reactor wall and the rotor rotate in the same direction, the angular velocity of the rotor being greater than that of the external reactor wall.

3. (Previously Presented) The Taylor reactor of claim 1, wherein the external reactor wall and the rotor have an essentially circular circumference over the entire reactor length, as viewed in cross section.

4. (Previously Presented) The Taylor reactor of claim 1, which is mounted vertically, the reaction medium being moved against gravity.

5. (Previously Presented) The Taylor reactor of claim 1, wherein the rotor is mounted centrically.

6. (Previously Presented) The Taylor reactor of claim 1, wherein the means for the discharge of the product is disposed at the highest point of the reactor lid.

7. (Previously Presented) The Taylor reactor of claim 1, wherein one or more of the external reactor wall and the rotor (2) are geometrically designed such that an annular gap widens in the flow direction.

8. (Previously Presented) The Taylor reactor of claim 7, wherein the circumference of the external reactor wall (1) increases in the flow direction.

9. (Previously Presented) The Taylor reactor of claim 7, wherein the external reactor wall has the form of a single frustum.

10. (Previously Presented) The Taylor reactor of claim 1, wherein one or more of the external reactor wall and the rotor are geometrically designed such that an annular gap narrows in the flow direction.

11. (Previously Presented) The Taylor reactor of claim 10, wherein the circumference of the external reactor wall (1) reduces in the flow direction.

12. (Previously Presented) The Taylor reactor of claim 10, wherein the external reactor wall has the form of a single frustum.

13. (Withdrawn) A process for converting substances, comprising
converting a substance in the Taylor reactor of claim 1,
wherein under the conditions of Taylor vortex flow, a viscosity v of a reaction medium increases in the course of a reaction.

14. (Withdrawn) The process of claim 13, wherein a first reaction takes place in a first flow-traversed subsection of the Taylor reactor and one or more additional reactions take place in one or more additional subsections as viewed in an axial flow direction downstream of at least one further means for metered addition of reactants.

15. (Withdrawn) A process for preparing addition polymers, copolymers, block copolymers and graft copolymers, polycondensation products and polyaddition products, core/shell latices, polymer dispersions, products of polymer- analogous reactions such as the esterification, amidation or urethanization of polymers containing side groups suitable for such reactions, olefinically unsaturated materials curable with electron beams or ultraviolet light, or mesophases, comprising using the process of claim 13.

16. (Withdrawn) A process for converting substances, comprising
converting a substance in the Taylor reactor of claim 1,
wherein under the conditions of Taylor vortex flow, a viscosity v of a reaction medium falls in the course of a reaction.

17. (Withdrawn) The process of claim 16, wherein a first reaction takes place in a first flow-traversed subsection of the Taylor reactor and one or more additional reactions take place in one or more additional subsections as viewed in an axial flow direction downstream of at least one further means for metered addition of reactants.

18. (Withdrawn) A process for the breakdown of high molecular mass comprising using the process claim 16.

19. (Withdrawn) A process for making moldings, paints, adhesives and other coating materials and films, comprising using as components thereof, substances prepared by the process of claim 13.

20. (Previously Presented) The Taylor reactor of claim 1, wherein the external reactor wall is stationary while the rotor rotates.

21. (Previously Presented) The Taylor reactor of claim 8, wherein the circumference of rotor (2) remains constant.

22. (Previously Presented) The Taylor reactor of claim 8, wherein the circumference of rotor (2) increases.

23. (Previously Presented) The Taylor reactor of claim 8, wherein the circumference of rotor (2) decreases.

24. (Previously Presented) The Taylor reactor of claim 7, wherein the external reactor wall is composed of a plurality of frusta.

25. (Previously Presented) The Taylor reactor of claim 11, wherein the circumference of the rotor remains constant.

26. (Previously Presented) The Taylor reactor of claim 11, wherein the circumference of the rotor increases.

27. (Previously Presented) The Taylor reactor of claim 11, wherein the circumference of the rotor decreases.

28. (Previously Presented) The Taylor reactor of claim 12, wherein the external reactor wall is composed of a plurality of frusta.